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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/613,068	07/10/2000	Se-Hyoung Kim	678-514-(APA9464	8817

28249 7590 06/14/2005

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EXAMINER	
KADING, JOSHUA A	
ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/613,068	KIM ET AL.	
	Examiner	Art Unit	
	Joshua Kading	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-18,20-22,25-34,37,38,41-43,45-47,49-53,55-58 and 61-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-18,20-22,25-30,32-34,37,38,41-43,45-47,49-53,56-58 and 61-70* is/are rejected.

7)☒ Claim(s) *31 and 55* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 8 is objected to because of the following informalities:

Claim 8, line 3, the word "pattern" should be added to the end of the claim. The end of the claim should read --to the regular pattern.--

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5, 7, 8, 12-17, 20-22, 26-30, 32-34, 37, 38, 41, 45-47, 50-53, 56-58, 61, 62, 64-66, 68, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,978,365, Yi in view of applicant's admitted prior art (AAPA).

Regarding claims 1, 13, 27, 37, 51, 61, 65, and 68, Yi discloses "an encoder for receiving an information bit stream transmitted at a predetermined transmission time interval (*col. 1, lines 15-18*) and for outputting the information bit stream and at least one type of parity stream by encoding the information bit stream in accordance with a coding rate of said encoder (*figure 6, element 502 is the encoder as seen in figure 5 and X1 is the information bit stream, Y1 is the first parity bit stream, and Y2 is the*

second parity bit stream as described in col. 14, lines 34-35); an interleaver for receiving the information bit stream and the at least one type of parity stream from the encoder, for interleaving the information bit stream and the at least one type of parity stream and for outputting interleaved stream (*figure 6, element 601 as described in col. 14, lines 10-11*); a demultiplexer for receiving the radio frames and for demultiplexing the received radio frames back into the information bit stream and the at least one type of parity stream (*figure 9, elements 901 and 902*); and a rate matcher for rate matching the streams received from the demultiplexer and outputting rate matched streams, said rate matcher having at least one component rate matcher for rate matching a part of the parity stream, a number of the at least one component rate matcher being equal to a number of the parity streams (*col. 17, lines 61-64 where the depuncturing of the streams is effectively rate matching the streams*), wherein the demultiplexer switches each of the parity bits in the radio frames to said at least one component rate matcher (*col. 17, lines 61-64 where the demultiplexer operates to rate match each signal and therefore it is strongly implied that each signal would enter into a respective rate matching device*)."

However, Yi lacks what AAPA discloses, "a radio frame segmenter for receiving the interleaved stream from the interleaver, for dividing the received stream into radio frames, and for outputting the radio frames in sequence (*figure 1, element 130; specification page 2, line 26-page 3, line 1*)" and that there are rate matchers that "correspond to each of the parity bits (*figure 1; elements 140, where there is only one*

rate matcher per stream and thus one of ordinary skill in the art would know that there is a corresponding number of rate matchers per bit streams)"

It would have been obvious to one with ordinary skill in the art at the time of invention to include the radio frame segmenter for the purpose of creating radio frames at a predetermined size. The motivation for creating the frames at predetermined sizes is so that they conform to the appropriate protocols and standards of other devices, such as the encoder.

Regarding claims 2, 20, 32, 45, 56, 62, 66, and 69, Yi lacks what AAPA further discloses, "wherein the interleaved stream is mapped onto consecutive radio frames when a transmission time interval (TTI) is longer than 10 ms (*specification, page 2, lines 20-28 where any of the TTIs lead to a mapping onto radio frames*)." It would have been obvious to one with ordinary skill in the art to include the TTI longer than 10ms for the same reasons and motivation as in claims 1, 13, 27, 37, 51, 61, 65, and 68.

Regarding claims 3, 21, 33, 46, and 57, Yi lacks what AAPA further discloses, "a transmission time interval (TTI) of the information bit stream is one of 10, 20, 40, and 80 ms (*specification page 2, line 21*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include one TTI of 10, 20, 40, and 80 ms for the same reasons and motivation as in claims 1, 13, 27, 37, and 51.

Regarding claim 5, Yi lacks what AAPA further discloses, "wherein an arrangement of information bits and parity bits in each of the at least one radio frames has a regular pattern (*specification page 3, lines 22-23*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the radio frame having a regular pattern with the transmitting device in claim 1 for the same reasons and motivation as in claim 1.

Regarding claims 16, 30, 38, and 53, Yi lacks what AAPA further discloses, "wherein bits of the radio frame are separated to the at least one component rate matcher corresponding to each type of parity stream in accordance with a regular pattern for arranging information bits and parity bits in each radio frame (*specification page 3, lines 22-23*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include separating the radio frame into streams following a regular pattern for the same reasons and motivation as in claims 13, 27, 37, and 51.

Regarding claims 7, 14, 28, 41, and 52, Yi lacks what AAPA further discloses, "the consecutive radio frames having initial bits determined by a TTI (*specification page 2, lines 21 and 23-24 where it is implied from the TTI's and the frame data size that the initial symbol will be different based on different TTI's*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the initial symbols determined by a TTI for the same reasons and motivation as in claims 2, 16, 30, 38, and 53.

Regarding claim 8, AAPA lacks what Yi further discloses, "wherein the demultiplexer separates bits of the radio frame into the third information bit stream, and the first and second parity streams from the demultiplexer according to the regular pattern (*figure 9, where the outputs of elements 901 and 902 are the information bit stream and parity streams as before*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the first bit stream, and second and third parity streams for the same reasons and motivation as in claim 5.

Regarding claims 12 and 64, Yi lacks what AAPA further discloses, "a first component rate matcher for rate-matching the information bits; a second component rate matcher for rate-matching the first parity bits; and a third component rate matcher for rate-matching the second parity bits (*figure 1, elements 140 where if N is equal to 3 then there are first, second, and third rate matchers*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the first, second, and third rate matchers for the same reasons and motivation as in claim 1 and 61.

Regarding claims 15 and 29, Yi lacks what AAPA further discloses, "wherein the regular pattern is further determined by the coding rate (*specification, page 2, lines 20-25 of the specification*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the determining the pattern using the coding rate with

the transmitting device in claim 14 and the method of claim 28 for the same reasons and motivation as in claims 14 and 28.

Regarding claim 17, Yi lacks what AAPA further disclose, "a multiplexer for multiplexing the rate matched streams outputs of at least one component rate matcher (*figure 1, element 150 where 150 takes in the different streams from the different rate matcher components 140 and multiplexes them*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the multiplexer with the transmitting device in claim 13 for the same reasons and motivation as in claim 13.

Regarding claims 22, 34, 47, and 58, AAPA lacks what Yi further discloses, "wherein the coding rate is 1/3 (*col. 4, lines 25-26*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the 1/3 coding rate for the same reasons and motivation as in claims 13, 27, 37, and 51.

Regarding claims 26 and 50, AAPA lacks what Yi further discloses, "wherein the encoder is a turbo encoder (*figure 5, element 502*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include turbo encoder for the same reasons and motivation as in claims 13, 27, 37, and 51.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yi and AAPA as applied to claim 1 above, and further in view of U.S. Patent 6,304,991 B1, Rowitch et al. (Rowitch).

Regarding claim 4, Yi and AAPA lack what Rowitch discloses, "wherein the interleaving rule is a bit reverse method (*col. 7, lines 36-59, specifically lines 56-59*)." It would have been obvious to one with ordinary skill in the art at the time of invention to have the interleaving rule be of a bit reverse method type for the purpose of providing time separation between the rows of the interleaver (*Rowitch, col. 7, lines 56-59*). The motivation for having time separation in the interleaver is to create a more robust and less error prone system by allowing each symbol enough spacing to be properly recognized on the receiver end.

5. Claims 11, 63, 67, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yi et al. and AAPA as applied to claims 1, 61, 65, and 68 above, and further in view of U.S. Patent 6,061,820, Nakakita et al. (Nakakita).

Regarding claims 11, 63, 67, and 70, Yi and AAPA lack what Nakakita discloses, "wherein the interleaver interleaving the encoded streams at a TTI (Transmission Time Interval) after inserting filler bits into the encoded streams in order to equalize a size of the at least one radio frames (*col. 19, lines 54-62*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the filler bits for the purpose of making the data a uniform length for interleaving (*Nakakita, figure 14A shows the filling of data to make a uniform length; AAPA, specification, page 2, lines 26-*

page 3, line 1 where the interleaver makes 10ms length radio frames and thus if there isn't enough data to create a 10 ms frame, Nakakita provides for padding with dummy data). The motivation is so that the created data will conform to the protocols and standards of the system.

6. Claims 25 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yi et al. and AAPA as applied to claims 16 and 41 above, and further in view of U.S. Patent 6,615,387 B1, Williamson et al. (Williamson).

Regarding claims 25 and 49, Yi and AAPA lack what Williamson discloses, "a memory for storing the regular pattern including an initial symbol corresponding to each of the radio frames (*col. 28, claim 18, lines 22-38 where the regular pattern is inherently stored in the way the codeword is created through the use of the memory and the initial symbol is stored by way of the LSB bits*)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the memory for storing the regular pattern and initial symbol for the purpose of creating a codeword for user data. The motivation for creating a codeword for data is to create a way to recover from errors in transmission.

7. Claims 9, 10, 18, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yi et al. and AAPA as applied to claims 8, 17, 27, 42, and 51 above, and further in view of U.S. Patent 5,881,109, Kim et al. (Kim).

Regarding claims 9, 18, and 43, Yi and AAPA lack what Kim discloses, "a memory for storing initial symbols of the consecutive radio frames (*figure 2, elements 51-56 as read in col. 4, lines 7-11 where the symbols from the respective channels are stored in a memory*); and a controller for controlling the demultiplexer according to the regular pattern and the stored initial bits of the at least one radio frame (*figure 2, element 41*)." It would have been obvious to one of ordinary skill in the art at the time of invention to include the symbol storage and demultiplexer controller for the purpose of storing symbol data for further use and preparation for transmission (*Kim, figure 2, elements 51 to multiplexer 60 and on to the D/A converter*). The motivation for storing symbol data is so that it is not lost if, for instance, the multiplexer is not ready to multiplex the new data.

Regarding claim 10, Yi and Kim lack what AAPA discloses, "a multiplexer for multiplexing the outputs of the rate matcher under a control of the controller (*figure 1, element 150*)." It would have been obvious to one of ordinary skill in the art at the time of invention to include the multiplexer for the same reasons and motivation as in claim 9.

Allowable Subject Matter

8. Claims 31 and 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments, see REMARKS, page 13, third paragraph, filed 19 January 2005, with respect to the rejections of all pending claims using U.S. Patent 6,553,539 B1, Markarian, under 35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made in view of newly found prior art.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua Kading whose telephone number is (571) 272-3070. The examiner can normally be reached on M-F: 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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